CLASS 522, SYNTHETIC RESINS OR NATURAL RUBBERS -- PART OF THE CLASS 520 SERIES

SECTION I - CLASS DEFINITION

GENERAL SUMMARY OF SUBJECT MATTER WITHIN THIS CLASS

A. The following types of claimed subject matter are proper for this class.

1. A claim drawn to a process of making a photopolymerizable composition of reactant X plus photoiniator or photosensitizer.

2. A claim drawn to a photopolymerizable composition of reactant X plus photoinitiator or photosensitizer.

3. A claim drawn to a process of irradiating reactant X with or without a photoinitiator or photosensitizer being present.

4. A claim drawn to a photopolymerizable composition of reactant X plus photoinitiator or photosensitizer and any other material (e.g., filler, solvent, etc.).

In the types of subject matter (1-4 above), reactant X can be a monomer, low molecular weight condensation or addition product, or solid polymer. The sole proviso is that the final product be a solid polymer as is required by the Class 520 Series of classes. When a claim so expressly states, a monomer or polymer is considered to be a photoinitiator or photosensitizer.

The recitation of a specified amount of photoinitiator or photosensitizer is unnecessary for purposes of classification in this class.

B. To be properly classified in this class, a compound must have a photoinitiator or photosensitizer claimed in addition to the monomer to be polymerized or the polymer to be treated. For example, a claim drawn to a photopolymerizable composition comprising an ethylenically unsaturated monomer plus a photoinitiator is properly classified herein, whereas a claim drawn to a substituted benzophenone autopolymerizable composition is not properly classifiable in this class. The requirement for proper classification is separateness of monomer or polymer and photoinitiator or phtosensitizer. A material described as being both a photoinitiator or photosenitizer and a reactant and a separate monomer or solid polymer is a proper composition for subclass 1 of this class. Products which are the result of a wave energy process are normally excluded from this class and are classified in other areas of the 520 Series of clases. An exception to this would be a situation wherein a further wave energy step is contemplated and the formed product is an admixture with a photoinitiator or photosensitizer.

A claim drawn to a specific photoinitiator such as a benzophenone with no mention in the claim of the functionality of the substance as a photoinitiator is classified herein if the disclosure teaches the use of benzophenone as a photoinitiator.

A combination of chemical process steps not involving wave energy followed by a subsequent chemical reaction involving wave energy is classified herein provided the product is proper subject matter for the Class 520 Series.

Claims drawn to the utilization of wave energy to initiate a chemical reaction followed by the application of heat are proper for this class. For example, a process of partially polymerizing a monomer of methylfluoroacrylate by wave energy followed by treatment with heat to complete the polymerization is proper for the Class 520 Series.

The utilization of wave energy to induce a chemical reaction which thereby proceeds without the assistance of further wave energy is considered to be proper subject matter for this class; for example, a claim drawn to utilizing wave energy to activate a peroxide in order to generate free radicals, wherein the free radicals promote a chemical reaction is classified herein.

SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

The step in a process claim utilizing wave energy is the proper basis for classification purposes. For example:

A. A claim drawn to processes of polymerixing ethylene in the presence of carbon black (DNRM) by wave energy is properly classified in subclass 71, whereas a claim drawn to polymerizing ethylene in the presence of wave energy followed by treating the product with carbon black (DNRM) is properly classified in subclass 189.

B. A claim drawn to treating polyacrylonitrile with vinyl chloride in the presence of energy is properly classified in subclass 124, whereas a claim drawn to treating

a graft polyacrylonitrile-vinyl chloride copolymer with wave energy is properly classified in subclass 149.

C. A claim drawn to the process of making polyethylene by polymerizing ethylene in the presence of wave energy followed by chemically treating said product with halogen (with no wave energy present) would be classified in subclass 189, whereas a claim drawn to the process of reacting polyethylene with halogen in the presence of wave energy following by the addition of carbon black would be classified in subclass 133.

Classification in Class 522 is on the first solid polymer prepared. For instance, a process of chemically modifying a solid polymer derived from ethylene only, by sulfonating, (nonwave energy process) and then subsequently reacting said sulfonated polymer with elemental halogen using wave energy is proper in subclass 133, since the first solid polymer prepared is polyethylene. Subclass 132 does provide for a halogenated polymer which is subsequently reacted in that the language of the subclass is “contains” rather than “derived”. In subclass 154 the language is “derived” and therefore if a halogenated polyethylene is treated using wave energy classification in subclass 161 is proper since the first solid polymer is prepared from ethylene.

A process of treating a solid polymer with wave energy followed by the addition of a chemical reactant is presumed, in the absence to the contrary to proceed entirely by wave energy and is classified in this class subclasses 113-147; however, a process of treating an irradiated polymer with a chemical reactant is properly classified in Class 525. Additionally a process of treating a reactant with wave energy followed by adding a solid polymer and reacting therewith is presumed in the absence of information to the contrary to proceed entirely by wave energy and is classified in this class.

A process of treating a preirradiated polymer (no wave energy process step recited) is properly classified in Classes 523-525 when no further wave energy step is claimed. For example, (1) a process of a mixed preirradiated polymer with a DNRM is properly classified in Class 524, and (2) a process for treating a preirradiated polymer with an ethylenic monomer is properly classified in Class 525.

The combination of Class 204 wave energy step followed by a Class 522 wave energy step is classified herein; for example, a claim drawn to a process of utilizing wave energy to synthesize a monomer which is subsequently polymerized in the presence of wave energy is classified herein.

The utilization of wave energy to generate heat, whereby the heat generates or induces a chemical reaction is not considrered to be “a chemical reaction induced by wave energy” and thus is not proper subject matter for Class 522. The process, however, is proper in for the Class 520 Series if a solid polymer is produced.

Class 204, Chemistry: Electrical and Wave Energy, appropriate subclasses provide for producing a product of the type provided for in the Class 520 Series by other than a wave energy process. Class 204 is superior to the Class 520 Series; therefore, a patent claiming in the alternative a process of preparing an organic compound and a synthetic resin or natural rubber in the presence of wave energy is classified for original purposes in Class 204 and cross-referenced to the Class 520 Series. In the situation where an alternative process claim is presented along with a specific process claim to the synthetic resin or natural rubber, there is no specific claim to the nonsynthetic resin or nonnatural rubber species, and the process is directed to wave energy, the same rule of original patent placement applies. Any process step involving electrolysis, an electric current, electro-osmosis, electrophoresis, an electrostatic field, an electrical discharge, or a magnetic field and also involving the preparing or treating of a synthetic resin or natural rubber is proper for Class 204, even when the wave energy step involved is subsequent to a Class 204 step. Combinations of chemical process steps provided for by the Class 520 Series (other than those involving wave energy) and process steps falling within the definition of Class 204 are proper for Class 204 when the Class 520 Series process steps are preparatory to the Class 204 process steps and are proper for the Class 520 Series when the Class 204 process steps are preparatory to the Class 520 Series process steps.

Class 430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, appropriate subclasses provide for radiation sensitive compositions and elements and for processes of exposing said composition or elements to wave energy using an imagewise exposure technique. Class 522 provides for compositions and processes involving use of radiation for polymerizing compositions having a photoinitiator or photosensitizer or for modifying polymers. Class 430 provides for compositions solely disclosed, or claimed for radiation imagery. Compositions and processes not involving radiation imagery, or disclosing both a radiation imagery use, and another use are placed in Class 522 and cross-referenced to Class 430. Also, see Class 430 classification line for compositions with art claimed, especially, multiple use (Class 430, III A 2a).

SECTION III - SUBCLASS REFERENCES TO THE CURRENT CLASS

Schedule Outline of Class 522: The schedule is divided into a number of parts, each of which is distinct and provides for different types of subject matter. The following SEARCH THIS CLASS, SUBCLASS is a breakdown of the major areas and indicates the type of subject matter provided therein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

1, generic subclass for the class.

2, through 5, for manipulative process areas which provide for certain designated processes of preparing or treating a polymer or compositions therefore. This area has no generic subclass and therefore documents not covered under the ambit of this subclass range are classified below on some other basis.

6, through 70, for the specified rate-affecting material area which provides for processes of preparing or treating polymers or compositions therefor wherein a rate-affecting material is utilized simultaneously with the wave energy and wherein at least one rate-affecting material is designated by at least one atom, e.g., a nitrogen-containing photoinitiator, etc. This area is further subdiveded into the following six subclass ranges.

7, through 30, for two or more rate-affecting materials, only one of which need be specifically claimed.

8, through 10, for either (1) at least two rate-affecting material containing a keto group which is not part of a ring (e.g., benzophenone, etc.) or (ii) the combination of one rate-affecting material containing a keto group which is not part of a ring plus a rate-affecting material referred to as a "photoinitiator or photosensitizer". The basic premise of these subclasses is that a rate-affecting material identified as a "photoinitiator or photosensitizer" is to be equated with a rate-affecting material containing a keto group wherein the keto group is not part of a ring.

11, for the combination of a rate-affecting material containing a keto group not part of a ring plus a broadly claimed rate-affecting material, other than "photoinitiator or photosensitizer", e.g., the combination of a benzophenone and a curing catalyst would be proper for this subclass, etc.

12, through 23, for the combination of either (1) a rate-affecting material containing a keto group not part of a ring plus a rate-affecting material wherein at least one atom is designated; or (2) a rate-affecting material referred to as a "photoinitiator or photosensitizer" plus a rate-affecting material wherein at least one atom is designated. The basis of classification in these subclasses is with the latter ingredient of the aforementioned combinations (1) and (2).

24, through 30, for the combination of two or more rate-affecting materials neither one of which contains a keto group not part of a ring. The basis of classification in these subclasses is with the first appearing rate-affecting material provided in the schedule hierarchy.

31, through 70, for specified rate-affecting material.

71, through 86, for the designated nonreactant areas provide for processes of preparing or treating polymers or compositions therefor, wherein a designated nonreactant material is present when the wave energy is applied.

87, through 189, for the polymer preparation or treatment area which provides for processes or compositions therefor of the following six categories.

87, through 108, specifically for proteins and carbohydrates as reactants and for treating a terminally unsaturated polyurethane, ethylenically unsaturated siloxane, polysiloxane, polyester or polypoxide derivative.

109, and 110, for chemically modifying a blend of two or more solid polymers by a chemical reactant.

111, and 112, for treating a blend of two or more solid polymers.

113, through 147, for chemically modifying a solid polymer by a chemical reactant in the presence of wave energy.

148, through 166, for treating a solid polymer in the presence of wave energy wherein a chemical reaction occurs.

167, through 189, for the preparation of a solid polymer by utilizing wave energy.

SECTION IV - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, for bleaching or dyeing; fluid treatment and chemical modification of textiles and fibers wherein use is made of electrical radiant or wave energy other than electrolysis, for which see Class 205, subclasses 689+.

128, Surgery, for electrical or wave energy treatment of the living human body and apparatus specialized therefor.

205, Electrolysis: Processes, Compositions Used Therein, Methods of Preparing the Compositions, subclasses 689+, for chemical modification of textiles and fibers using electrolysis.

252, Compositions, for electrical or wave energy methods, other than electrolytic for the preparation of dispersions.

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 131+ for polymerization apparatus.

427, Coating Processes, for processes of coating a substrate followed by curing the coating using electrical or wave energy. Included in Class 427 are processes of producing a coating by application of wave energy chemistry to a base material which supplies a part or all of the coating, e.g., conversion of the surface of a polymeric material to produce a film thereon by the application of wave energy, etc.

525, through 528, Synthetic Resins or Natural Rubbers, appropriate subclasses for processes of preparing and treating polymers by chemical and physical means.

SECTION V - GLOSSARY

DESIGNATED NONREACTANT MATERIAL (DNRM)

As used in this class, designated nonreactant material (DNRM) is a material wherein at least one of the chemical atoms can be deduced with certainty. For purposes of this class, organic material although inherently reciting the presence of a carbon atom is considered to be too broad. An exemplary list of materials to be regarded as DNRM's is as follows: metal hydrate, chalcogen, carboxylic acid, peroxy, peroxide, latex, alkali or alkaline earth metal, transition metal, halogen, proten donor, sulfiede, drying oil, fat, fatty acid or ester, water, carbon black, etc. This list is by no means limited to the above examples.

The following list is not exhaustive and merely enumerates certain materials that will not be considered as DNRM's, e.g., organic compound, metal containing, inorganic compound, organometallic compound, solvent, wax, magnetic, hydrophobic, hydrophillic, antiplasticizer, plasticizer, filler, preservative, antioxidant, antiozonant, stablizer, lubricant, fibrous additive, particulate additive, liquid, solid, gas, dispersant, emulsifier, crystalline, plastic, flourescent, phosphorescent, liminescent, deliquescent, drier, dessicant, humectant, blue color,numerically described without providing a chemical atom, Lewis acid or base, mineral, organic solvent, cosolvent, Ziegler or Natta catalysts, alfin catalyst, free radical, amphoteric, anionic, ionic, denaturant, electrostatic, dielectric, conductor, insulator, etc. This list is to be regarded as illustrative rather than exhaustive.

WAVE ENERGY

The term "wave energy" includes radiations as well as wave energies transmitted by various mediums and embraces electromagnetic waves or radiations, ultrasonic and supersonic waves, nuetrons, protons, duetron, and other corpuscular radiations.

ELECTROMAGNETIC WAVES

The term "electromagnetic waves" as employed herein includes, for example, X-rays and gamma rays; ultraviolet, infrared, and visible light rays, and short electric and radio waves. Energy which produces merely a thermal effect or heat waves, per se, is excluded. Microwave energy is considered to produce a thermal effect unless there is a direct statement to the contrary, and is not proper for this class.

SUBCLASSES

1 COMPOSITIONS TO BE POLYMERIZED BY WAVE ENERGY WHEREIN SAID COMPOSITION CONTAINS A RATE-AFFECTING MATERIAL; OR COMPOSITIONS TO BE MODIFIED BY WAVE ENERGY WHEREIN SAID COMPOSITION CONTAINS A RATE-AFFECTING MATERIAL; OR PROCESSES OF PREPARING OR TREATING A SOLID POLYMER UTILIZING WAVE ENERGY:

This subclass is indented under subclass 1. Subject matter under Class 520, ... involving processes of (1) preparing a solid polymer in the presence of wave energy is employed to induce the polymerization; or (2) chemically

modifying a solid polymer with a chemical reactant in the presence of wave energy is employed to induce the reaction; or (3) modifying a solid polymer by wave energy wherein the wave energy induces a chemical reaction in the solid polymer; and compositions of (1), (2) and (3) to be polymerized or reacted provided a photoinitiator or photosensitizer is present.

2 Processes of forming or modifying a solid polymer by laser; or compositions therefore:
This subclass is indented under subclass 1. Subject matter involving the use of light amplified by stimulated emission of radiation, i.e., laser, or composition therefore.

(1) Note. This area provides for a specific wave energy process, i.e., laser. In order for a wave energy process to be classified herein as an original, there must be a claim to the noted process or the total disclosure in the patent must be directed to the specific process. The wave energy process in the claim need not be limited to the provided specific process if the claim specifically recites the process of this subclass. Processes not claimed or solely disclosed are classified below on some other aspect.

(2) Note. This subclass provides for compositions perfected so as to be utilized with a laser. See General Rules As To Patent Placement in the class definition.

SEE OR SEARCH CLASS:
216, Etching a Substrate: Processes, subclass 65 for process of using a laser in combination with chemical etchant.

3 Processes of forming or modifying a solid polymer wherein specific mixing, stirring, agitating, movement of material or directional orientation is employed; or compositions therefore:
This subclass is indented under subclass 1. Subject matter involving specific mixing, stirring, agitating, movement of material or directional orientation; or compositions therefor.

(1) Note. The steps of mixing, stirring, agitating, movement of material or directional orientation must involve a direct relationship with wave energy and not be ancillary to the wave energy exposure. For instance, mixing two ingredients under specific conditions to merely form a composition which is then exposed to a form of wave energy is not proper for this subclass; however, mixing of the same ingredients under the same conditions while said formed composition is exposed to wave energy is proper herein.

(2) Note. Specified for purposes of this subclass requires the naming of a movement imparting rotor, stirrer, impeller or any other device in terms of its specific dimension, design, size, or shape therefor, or requires the recitation of a reactor of a design to facilitate movement or agitation; or requires a positive recitation in the claims as to velocity or designated time of mixing, said time being either continuous or intermittent.

(3) Note. Directional orientation includes adding material horizontally, tangentially, from above or below, etc.

(4) Note. This subclass also provides for those compositions perfected so as to be utilized is a process involving the requirements of this subclass.

4 Process of forming or modifying a solid polymer by wave energy wherein at least two distinct external radiant energy sources are utilized; or compositions therefore:
This subclass is indented under subclass 1. Subject matter involving the use or at least two distinct energy sources; or compositions therefore.

(1) Note. The two sources or energy maybe utilized in any manner, e.g., successive, or concurrent, etc. Each of the energy sources must cause a chemical reaction of its own right or must potentiate, accelerate, or have a synergistic affect in regard to the chemical reaction involved.

(2) Note. This subclass also provides for those compositions perfected so as to be utilized in a process involving the requirements or this subclass.

(3) Note. "Distinct" as used in this subclass includes the same type of energy either derived from one or more sources when said energy is used at different energy levels or wave length levels. It also includes the same type of energy derived from two different generating sources.

5 Processes of forming or modifying a solid polymer by wave energy wherein a temperature less than 0xC (32xF) or greater than 250xC(482xF) is employed; or compositions therefore:

This subclass is indented under subclass 1. Subject matter involving a temperature less than 0xC (32xF) or greater than 250xC (482xF); or compositions therefore.

(1) Note. The temperature conditions required must involve a direct relationship with wave energy. For instance treatment of a material by wave energy and subsequent physical treatment at the temperature lower than 0xC is not proper subject matter for this subclass.

(2) Note. A process performed while "frozen" or under "cryogenic" conditions will be placed herein unless there is a disclosure that the temperature is greater than 32xF.

(3) Note. This subclass also provides for those compositions perfected so as to be utilized in a process involving the requirements of this subclass.

6 Compositions to be polymerized or modified by wave energy wherein said composition contains at least one specified rate-affecting material; or processes of preparing or treating a solid polymer utilizing wave energy in the presence of a least one specified rate-affecting material, e.g., nitrogen containing photosensitizer, oxygen containing photoinitiator, etc.:

This subclass is indented under subclass 1. Subject matter wherein said process or composition to be polymerized or modified requires, in addition to the wave energy source, at least one specified rate-affecting material.

(1) Note. A rate-affecting material is a material which either affects the rate of reaction, permits reduced amount of wave energy, increases or decreases the degree of polymerization, cure, cross-linking, or grafting, or scavenges or provides storage stability of reactive materials or inhibits reaction; and includes photoinitiator, photosensitizer, activator, dark storage stabilizer, accelerator, inhibitor, or initiator reducing agent, retarder, photoreducible dye, sensitizing auxiliary, electron donor, generator, or curing catalyst.

(2) Note. A curing agent is presumed to be a cross-linking agent and is not considered to be a rate-affecting material. A curing catalyst, on the other hand, is considered to be a rate-affecting material.

(3) Note. A specified rate-affecting material is a rate-affecting material (see (1) Note) wherein at least one of the chemical atoms can be deduced with certainty. The following are examples of specified rate-affecting materials: benzophenone, oxygen containing curing catalyst, and a metal oxide containing inhibitor. The following are examples or rate-affecting materials which are not specified: a metal containing rate-affecting material, an organic containing rate-affecting material, an inorganic catalyst, an organometallic catalyst, a Lewis acid or base catalyst, a Ziegler catalyst.

(4) Note. A compound not claimed although solely disclosed as a rate-affecting material is considered to be a proper specified rate-affecting material. For example, a claim drawn to a process of preparing a solid polymer in the presence of wave energy and a metal oxide is disclosed as functioning in a catalyst capacity.

(5) Note. Unless disclosed to the contrary, a benzophenone or derivative thereof is presumed to be a specified rate-affecting material though not claimed or disclosed as having catalytic activity.

SEE OR SEARCH THIS CLASS, SUBCLASS:

71, for pigmented materials which function only to change the quantity of radiation received. These are considered to be DNRM'.

7 Contains two or more rate-affecting materials, at least one of which is specified:

This subclass is indented under subclass 6. Subject matter wherein at least two rate-affecting materials are claimed; at least one rate-affecting material is specified.

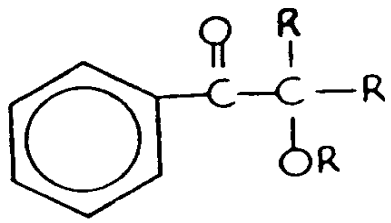
(1) Note. An example of a patent properly classified in this subclass is a photoinitiator and a metal oxide curing catalyst.

8 At least two specified rate-affecting material containing keto group not part of a ring; or contains nonspecified photoinitiator or photosensitizer and a specified ketone containing material wherein the keto group is not part of a ring:

This subclass is indented under subclass 7. Subject matter wherein either (a) at least two rate-affecting materials are specified and each of which contains at least one organic keto group not part of a ring system, or (b) the combination of one specified rate-affecting material containing at least one organic keto group not part of a ring system plus a rate-affecting material designated as either a "photosensitizer" or "photoinitiator".

(1) Note. Examples of combinations of rate-affecting materials proper for this subclass include

(a)



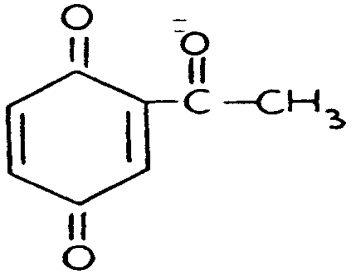
+ photosensitizer

(b)acyloin photoinitiator + benzophenone

(c)diaminobenophenone photosensitizer+ benzophenone

(d)a mixture of benzophenone and Michler's ketone as the photoinitiator

(2) Note. A material having a keto group as part of a ring may still be proper for this subclass if in fact an additional keto group is present which is not part of a ring, e.g.,



etc.

(3) Note. Ring as used in this subclass includes heterocyclic rings, carbocyclic, or any other ring system.

(4) Note. See Class 520, the Glossary, for a definition of the term "ketone".

SEE OR SEARCH THIS CLASS, SUBCLASS:

68, for a ketone containing a C=O group wherein the C of the C=O is part of a carbocyclic ring and there are no other keto moieties.

9 With a heterocyclic specified rate-affecting material:

This subclass is indented under subclass 8. Subject matter which includes an additional specific rate-affecting material which is heterocyclic.

(1) Note. See Class 520, the Glossary, for the definition of "heterocyclic".

(2) Note. An example of a patent proper for this subclass is one having the combination of (a) a 2,2, '-deithiobis-(benzothiazole) sensitizer (b) aromatic ketone

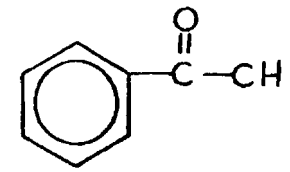
photosensitizer and an (c) aromatic ketone photosensitizer.

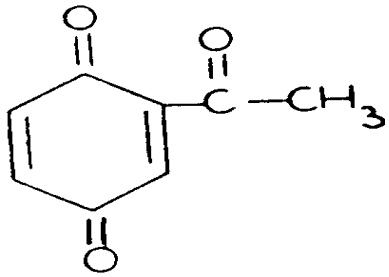
10 With a tertiary amine specific rate-affecting material:

This subclass is indented under subclass 8. Subject matter which includes an additional specific rate-affecting material which contains a trivalent nitrogen atom bonded to three atoms which are other than hydrogen.

11 Contains compound containing keto group not part of a ring and nonspecified rate-affecting material other than mere photoinitiator or photosensitzer:

This subclass is indented under subclass 7. Subject matter wherein one rate-affecting material containing at least one organic keto group not part of a ring, as below at the end of this definition, and the other rate-affecting material is one wherein none of the chemical atoms can be deduced from the claim with certainty and wherein the rate-affecting material which is not chemically stated is other than a photoinitiator or phtosensitizer.





(1) Note. A material having a keto group as part of a ring may still be proper for this subclass if in fact an additional keto group is present which is not part of a ring, e.g., as shown in the second illustration, above.

(2) Note. Ring as used in this subclass includes heterocyclic rings.

(3) Note. See Class 520, the Glossary, for a definition of the term “Ketone”.

SEE OR SEARCH THIS CLASS, SUBCLASS:

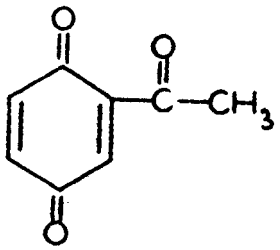
8+, for a system containing a specified rate-affecting material containing at least one keto group not part of a ring in combination with a rate-affecting material designated merely as a “photoinitiator” or “photosensitizer”.

12 Contains compounds containing keto group not part of ring and a specified rate-affecting material; or contains a specified rate-affecting material and a nonspecified photoinitiator or photosensitizer:

This subclass is indented under subclass 7. Subject matter wherein either (a) one rate-affecting material contains a keto group not part of a ring plus a specified rate-affecting material or (b) one specified rate-affecting material plus a rate-affecting material designated merely as a “photoinitiator” or “photosensitizer”.

(1) Note. Classification in the subclasses indented hereinunder is based upon the first-appearing specified rate-affecting material.

(2) Note. A material having a keto group as part of a ring may still be proper for this subclass if in fact an additional keto group is present which is not part of a ring, e.g.,



etc.

(3) Note. Ring as used in this subclass includes heterocyclic rings, carbocyclic, or any other ring system.

(4) Note. See Class 520, the Glossary, for a definition of the term “ketone”

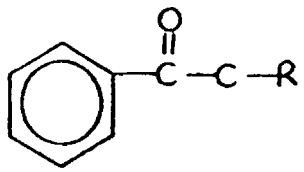
SEE OR SEARCH THIS CLASS, SUBCLASS:

8+, for the combination of either two rate-affecting materials both of which contain a keto group not part of ring or one specified rate-affecting material containing a keto group not part of a ring plus a rate-affecting material designated merely as a “photoinitiator” or photosensitizer”.

13, for peroxide catalyst plus benzoin ethyl ether catalyst.

21, for the combination of resorcinol monobenzoate plus photoinitiator.

22, for the combination of $Mn_2(CO)_{10}$ plus



13 Specified rate-affecting material is a peroxide or azo compound:

This subclass is indented under subclass 12. Subject matter wherein the specified rate-affecting material contains a -O-O- or N=n group.

14 Specified rate-affecting material is an amide or tertiary amine:

This subclass is indented under subclass 12. Subject matter wherein the specified rate-affecting material is an amide of a carboxylic acia or a nitrogen compound having a nitrogen atom substituted by three organic radicals, i.e., R^3N.

(1) Note. See Class 520, the Glossary, for a definition of the term “amine”.

(2) Note. See Class 520, the Glossary, under carboxylic acid or derivative for a definition of the term “carboxylic acid amide”.

SEE OR SEARCH THIS CLASS, SUBCLASS:

15, for nitrogen containing onium group compounds as rate-affecting materials.

15 Specified rate-affecting material contains onium group:

This subclass is indented under subclass 12. Subject matter wherein the specified rate-affecting material is an onium group containing compound.

16 Specified rate-affecting material is heterocyclic:

This subclass is indented under subclass 12. Subject matter wherein the specified rate-affecting material is a heterocyclic ring compound.

(1) Note. See Class 520, the Glossary, for a definition of the term “heterocyclic.

17 Specified rate-affecting material contains sulfur:

This subclass is indented under subclass 12. Subject matter wherein the specified rate-affecting material contains a sulfur atom.

18 Specified rate-affecting material contains phosphorus, arsenic, antimony or nitrogen atom:

This subclass is indented under subclass 12. Subject matter wherein the specified rate-affecting material contains at least one atom of phosphorus, arsenic, antimony or nitrogen.

19 Specified rate-affecting material is an aldehyde or aldehyde derivative:

This subclass is indented under subclass 12. Subject matter wherein the specified rate-affecting material is an aldehyde or aldehyde derivative.

(1) Note. See Class 520, the Glossary, for a definition of the term “aldehyde” and “aldehyde derivative”.

20 **Specified rate-affecting material is a carboxylic acid or derivative:**
This subclass is indented under subclass 12. Subject matter wherein the specified rate-affecting material is a carboxylic acid or derivative.

(1) Note. See Class 520, the Glossary, for a definition of the term "carboxylic acid or derivative". By schedule hierarchy the derivatives in this area are limited to acyclic anhydrides, esters and salts.

21 **Specified rate-affecting material contains C-OH or C-O-C group:**
This subclass is indented under subclass 12. Subject matter wherein the specified rate-affecting material contains a C-OH or C-O-C Group.

22 **Specified rate-affecting material contains an inorganic compound:**
This subclass is indented under subclass 12. Subject matter wherein the specified rate-affecting material is an inorganic compound.

(1) Note. See Class 520, Glossary, for the definition of "organic". For purposes of this subclass, inorganic compounds are those not included in said definition.

23 **Specified rate-affecting material contains only carbon and hydrogen or halogen and at least one atom of carbon is bonded to hydrogen or a halogen atom:**
This subclass is indented under subclass 12. Subject matter wherein the specified rate-affecting material contains at least one atom of carbon bonded to at least one atom of hydrogen or halogen and wherein no other diverse atoms are present.

24 **Specified rate-affecting material is a peroxide:**
This subclass is indented under subclass 7. Subject matter wherein at least one of the specified rate-affecting materials contains a O-O group.

25 **Specified rate-affecting material contains onium group:**
This subclass is indented under subclass 7. Subject matter wherein at least one of the specified rate-affecting materials is an onium group containing compound.

26 **Specified rate-affecting material is heterocyclic:**
This subclass is indented under subclass 7. Subject matter wherein at least one of the specified rate-affecting materials contains a heterocyclic ring.

(1) Note. See Class 520, Glossary, for a definition of the term "heterocyclic.

27 **Specified rate-affecting material contains sulfur:**
This subclass is indented under subclass 7. Subject matter wherein at least one of the specified rate-affecting materials contains a sulfur atom.

28 **Specified rate-affecting material contains phosphorus, arsenic, antimony or nitrogen:**
This subclass is indented under subclass 7. Subject matter wherein at least one of the specified rate-affecting materials contains an atom of phosphorus, arsenic, antimony, or nitrogen.

29 **Specified rate-affecting material is a metal-containing organic compound:**
This subclass is indented under subclass 7. Subject matter wherein at least one of the specified rate-affecting materials is organic and contains at least one metal atom.

(1) Note. See Class 520, the Glossary, for a definition of the terms "metal" and "organic compound".

30 **Specified rate-affecting material is organic:**
This subclass is indented under subclass 7. Subject matter wherein at least one of the specified rate-affecting materials is organic.

(1) Note. See Class 520, Glossary, for a definition of the term "organic compound".

31 Specified rate-affecting materials contains onium group:
This subclass is indented under subclass 6. Subject matter wherein the specified rate-affecting material is an onium group containing compound.

32 Diazonium containing material:
This subclass is indented under subclass 31. Subject matter wherein the specified rate-affecting material contains a -N=N salt group.

33 Specified rate-affecting material contains a ketone group -c- $(CO)_n$ -c-, the $(CO)_n$ not being part of a ring:
This subclass is indented under subclass 6. Subject matter wherein the specified rate-affecting material contains at least one keto group which is not part of a ring system.

(1) Note. See Class 520, Glossary, for a definition of the term "ketone". The type of ketone materials excluded from this subclass are, for instance, those where oxygen is solely double bonded to a carbon atom and which carbon atom is part of a carbocyclic ring, or any other ring system.

(2) Note. Included in this subclass are those compounds which may contain two or more ketone moieties and wherein one of the C=O groups is part of a part of a ring system and wherein at least one C=O group is not.

34 Containing ethylenic unsaturation:
This subclass is indented under subclass 33. Subject matter wherein the ketone compound is ethylenically unsaturated.

(1) Note. See Class 520, Glossary, for a definition of the term "ethylenically unsaturated".

35 Contained in polymeric rate-affecting material, e.g., synthetic resin, etc.:
This subclass is indented under subclass 33. Subject matter wherein the ketone containing material is polymeric in nature.

(1) Note. The polymeric material may be liquid or solid.

36 Containing two or more ketone groups:
This subclass is indented under subclass 33. Subject matter wherein the ketone compound contains at least two ketone groups.

(1) Note. For purposes of this class, a compound containing a -CC group, wherein * is two or more, is considered as being a plural ketone containing compound. Additionally, a compound containing a -CCC- group is considered as having two ketone groups may be part of a ring system as long as another ketone group is present which is acyclic.

37 Adjacent (C=O) * groups where * is at least two:
This subclass is indented under subclass 36. Subject matter wherein the ketone compound contains at least two carbonyl groups that are adjacent to each other.

38 Containing phosphorus:
This subclass is indented under subclass 33. Subject matter wherein the ketone compound contains at least one atom of phosphorus.

39 Containing nitrogen:
This subclass is indented under subclass 33. Subject matter wherein the ketone compound contains at least one atom of nitrogen.

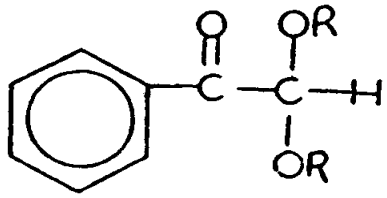
40 Containing C-CO-CHOH, e.g., benzoin, etc.:
This subclass is indented under subclass 33. Subject matter wherein the ketone compound contains the structure C, e.g., benzoin, etc.

41 Containing C-CO-CHOH-CHOR wherein R is organic:
This subclass is indented under subclass 40. Subject matter wherein the ketone compound contains the structure C wherein R is organic.

42 Containing C-CO-C(R)(OH) wherein R is organic:
This subclass is indented under subclass 33. Subject matter wherein the ketone compound contains the structure C, wherein R is organic.

43 Containing C-CO-C(H)(OR) wherein R is organic, e.g., benzoin methyl ether, etc.:
This subclass is indented under subclass 33. Subject matter wherein the ketone compound contains the structure, below, wherein R is organic, e.g., benzoin methyl ether, etc. C

44 Containing C-CO-C(R)(OR) wherein R is organic, e.g., diethyoxacetophenone, etc.:
This subclass is indented under subclass 33. Subject matter wherein the ketone compound contains the structure, below, wherein R is organic. For an example, see the structure following the one immediately below.



etc.

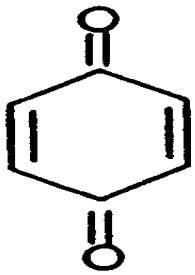
(1) Note. Diethoxyacetophenone is considered proper for this subclass unless specifically identified as to where the ether linkages are connected and which, if specified, differ from that required by the definition of this subclass.

45 Containing halogen, e.g., chloroacetone, etc.:
This subclass is indented under subclass 33. Subject matter wherein the ketone compound contains at least one atom of halogen.

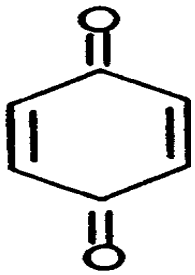
(1) Note. Halogen is limited to fluorine, chlorine, bromine, iodine or astatine.

46 At least two aryl groups connected directly to same carbonyl carbon, e.g., benzophenone, etc.:
This subclass is indented under subclass 33. Subject matter wherein the ketone compound contains the structure RR, wherein both R groups are aryl.

47 Specified rate-affected material is a quinone:
This subclass is indented under subclass 6. Subject matter wherein the specified rate-affecting material contains the structure, i.e.



48 Quinone ring is part of polynuclear system, e.g., anthraquinone, etc.:
This subclass is indented under subclass 47. Subject matter wherein the group, as shown below, is bonded at least two of its carbon atoms with additional atoms which form a ring therewith.



49 Specified rate-affecting material contains chalogen other than as oxygen:
This subclass is indented under subclass 6. Subject matter wherein the specified rate-affecting material contains an atom of sulfur, selenium or tellurium.

50 Hetero nitrogen ring:
This subclass is indented under subclass 49. Subject matter wherein the chalcogen compound contains at least one heterocyclic nitrogen ring.

(1) Note. See Class 520, Glossary, for a definition of the term “heterocyclic”.

(2) Note. The chalcogen atom can be part of the heterocyclic nitrogen ring.

51 Containing mercapto or mercaptide group, e.g., (thio) mercaptobenzoxazole, etc.:
This subclass is indented under subclass 50. Subject matter wherein sulfur is present as C-SH or C-S metal and wherein the carbon atoms

bonded to sulfur are not double bonded to a chalcogen atom.

52 Containing halogen:
This subclass is indented under subclass 50. Subject matter the heterocyclic ring compound contains at least one halogen atom.

(1) Note. Halogen is limited to fluorine, cholrine, bromoine, iodine or astatine.

53 Hetero sulfur ring:
This subclass is indented under subclass 49. Subject matter wherein sulfur is present as an atom in a heterocyclic ring.

(1) Note. See Class 520, Glossary, for a definition of the term “heterocyclic”.

54 C-(S)* -C wherein* is at least two:
This subclass is indented under subclass 49. Subject matter wherein sulfur is present as C-(S)*-C and wherein * is at least two.

55 Sulfide:
This subclass is indented under subclass 49. Subject matter wherein sulfur is present as C-S-C or Me-S-Me (Me is a monovalent metal) and wherein the carbon atoms bonded to the sulfur are not double bonded to chalcogen.

56 Mercapto group attached directly to aromatic ring, e.g., thiophenol, etc.:
This subclass is indented under subclass 49. Subject matter wherein sulfur is present as C-SH and wherein the carbon atom bonded to the sulfur is part of an aryl ring.

57 Nitrogen containing compound:
This subclass is indented under subclass 49. Subject matter wherein the chalcogen compound also contains a nitrogen atom.

58 Sulfenate, e.g., R-O-S-R, etc.:
This subclass is indented under subclass 49. Subject matter wherein sulfur is present as part of a R-O-S-R group, wherein R is part of an organic radical, e.g., sulfenate, etc.

59 (O=S=O), e.g., sulfuryl or sulfonyl containing, etc.:
This subclass is indented under subclass 49. Subject matter wherein sulfur is double bonded to at least two oxygen atoms, e.g., sulfur dioxide, etc.

60 Specified rate-affecting material is a peroxide:
This subclass is indented under subclass 6. Subject matter wherein the specified rate-affecting material contains at least one -O-O- group.

61 Hydroperoxide:
This subclass is indented under subclass 60. Subject matter wherein the specified rate-affecting compound contains at least one -O-O-H group.

62 Specified rate-affecting material contains a C-N=N-C group:
This subclass is indented under subclass 6. Subject matter wherein the specified rate-affecting material contains at least one -N=N- and wherein the nitrogen atoms are directly bonded to carbon atoms of discrete organic radicals.

SEE OR SEARCH THIS CLASS, SUBCLASS:
63, for compounds which contain the N=N group bonded to atoms so that a hetercyclic ring is formed thereby.

63 Specified rate-affecting material contains nitrogen or oxygen atom in heterocyclic ring:
This subclass is indented under subclass 6. Subject matter wherein the specified rate-affecting material contains oxygen or nitrogen in a heterocyclic ring.

(1) Note. See Class 520, Glossary, for a definition of the term “heterocyclic”.

64 Specified rate-affecting material contains nitrogen:
This subclass is indented under subclass 6. Subject matter wherein the specified rate-affecting material contains at least one phosphorus atom.

65 Specified rate-affecting material contains nitrogen:
This subclass is indented under subclass 6. Subject matter wherein the specific rate-affecting material contains at least one nitrogen atom.

66 Specified rate-affecting material contains metal atom:
This subclass is indented under subclass 6. Subject matter wherein the specified rate-affecting material contains at least one metal atom.

(1) Note. See Class 520, Glossary, for a definition of the term "metals".

67 Specified rate-affecting material contains halogen:
This subclass is indented under subclass 6. Subject matter wherein the specified rate-affecting material contains at least one haloglen atom.

(1) Note. Halogen is limited to fluorine, chlorine, iodine, bromine or astatine.

68 Specified rate-affecting material contains oxygen:
This subclass is indented under subclass 6. Subject matter wherein the specified rate-affecting material contains at least one oxygen atom.

69 Phenolic, e.g., hydroquinone, etc.:
This subclass is indented under subclass 68. Subject matter wherein the oxygen atom is part of a phenolic group.

(1) Note. See Class 520, Glossary, under "phenolic reactant" for a definition of the term "phenol".

70 Specified rate-affecting material contains only carbon and hydrogen:
This subclass is indented under subclass 6. Subject matter wherein the specified rate-affecting material is composed solely of carbon and hydrogen atoms.

71 Processes of preparing or treating a solid polymer by wave energy in the presence of a designated nonreactant material (DNRM); or composition therefore:
This subclass is indented under subclass 1. Subject matter involving the preparation or treatment of a solid polymer in the presence of wave energy and in the presence of a designated nonreactant material (DNRM); or a composition to be polymerized to produce a solid polymer in the presence of a DNRM; or a composition containing a solid polymer to be modified in the presence of a designated nonreactant material (DNRM).

(1) Note. See the Glossary in this class (522) for a definition and examples of the term "designated nonreactant material" (DNRM).

(2) Note. For proper classification in this subclass, the designated nonreactant material must be present during the wave energy treatment and must exercise a function subsequent to the wave energy step. A material which functions prior to the wave energy step and which function is destroyed or not intended subsequent to the wave energy step is not proper for this subclass.

(3) Note. By schedule exclusion the subject matter in this area may have a nonspecified rate-affecting material included.

(4) Note. In the subclasses below which recite a designated nonreactant material (DNRM) in the title, the indented subclasses merely pertain to a further elaboration of the DNRM and do not relate to any other material.

(5) Note. This subclass provides for compositions perfected as to be utilized in a process involving wave energy and a DNRM material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
71, for a process of polymerizing ethylene by wave energy in the presence of carbon black intended as a filler.
189, for a process of mixing irradiated polyethylene with halogen in the presence of wave energy followed by the addition of carbon black.

72 Carbohydrate or derivative DNRM:
This subclass is indented under subclass 71. Subject matter wherein the DNRM material is a carbohydrate or derivative.

(1) Note. See Class 520, Glossary, for a definition of the term "carbohydrate". A derivative of a carbohydrate must retain the carbohydrate skeleton.

73 Coal, asphaltic, or bituminous material DNRM:
This subclass is indented under subclass 71. Subject matter wherein the DNRM is coal or a derivative; or is a bituminous material or derivative or extract thereof; or is a bituminous material or a derivative or extract thereof; or is a fatty still residue.

(1) Note. Included within the subclass are oil shale or shale material from which oil has or has not been recovered as well as stearine pitch, coke products, coal tar and pitches.

(2) Note. Chemical compounds which are the results of a synthesis reaction utilizing a petroleum or coal source as a reactant are not the type of material which will generally qualify as a DNRM under this subclass.

(3) Note. Included within this subclass are materials generally described as asphalt. Asphalt derived from natural deposits, e.g., gilsonite, etc., coal or petroleum is included herein.

(4) Note. Bituman refers to solid or semi-solid materials which are often black or dark brown and which occur naturally or are obtained by refining petroleum or are the components of coal which are soluble in organic solvents. The term also applies generically to include natural and synthetic asphalts, tar and pitches; for example, natural asphalts such as Trinidad, Bermuda, gilsonite, graphamite, and Cuban, etc. Petroleum asphalt may be used such as these obtained from California crudes, Smack over Arkansas crudes, Mid-Continental air-blown oils, Mexican petroleum asphalts, tarry residues known as cracked asphalts by-products during the cracking of gas oil, or other heavier petroleum fractions to obtain gasoline or other lighter fractions, etc. Further still, bituminous materials may be used as coal tar, wood tar, petroleum pitches, and pitches obtained from various industrial processes such as a fatty acid pitch, etc.

(5) Note. Materials which are substantially known as to chemical constitution are excluded from this subclass and are classified below in the schedule on the basis of chemical constitution. If any doubt exists as to whether a material is of sufficient chemical identity so as to be classified as a specific DNRM, then such doubt is to be resolved by classifying the claim as an original in this area and cross-referencing to the appropriate DNRM area. Certain hydrocarbon materials which have been designated as not being proper herein are hydrocarbon petroleum distillation products, petroleum, and petroleum crude oils.

SEE OR SEARCH THIS CLASS, SUBCLASS:
80, for a hydrocarbon DNRM which is derived from coal.

74 Organic DNRM:
This subclass is indented under subclass 71. Subject matter wherein the DNRM is an organic compound.

(1) Note. See Class 520, Glossary, for the definition of the term "organic compound".

75 Heterocyclic ring containing DNRM:
This subclass is indented under subclass 74. Subject matter wherein the organic DNRM compound is heterocyclic.

(1) Note. See Class 520, Glossary, for definition of the term "heterocyclic".

76 Phosphorus containing DNRM:
This subclass is indented under subclass 74. Subject matter wherein the organic DNRM compound contains at least one phosphorus atom.

77 Silicon containing DNRM:
This subclass is indented under subclass 74. Subject matter wherein the organic DNRM compound contains at least one silicon atom.

78 Nitrogen containing DNRM:
This subclass is indented under subclass 74. Subject matter wherein the organic DNRM compound contains at least one nitrogen atom.

79 Oxygen containing DNRM:
This subclass is indented under subclass 74. Subject matter wherein the organic DNRM compound contains at least one oxygen atom.

80 Carbon and hydrogen only containing DNRM:
This subclass is indented under subclass 74. Subject matter wherein the organic DNRM compound is composed solely of carbon and hydrogen atoms.

81 Heavy metal containing DNRM:
This subclass is indented under subclass 71. Subject matter wherein the DNRM contains a heavy metal atom in either elemental or inorganic compound form.

(1) Note. Heavy metal is limited to those metal elements that have a specific gravity greater than 4.0.

82 Phosphorus or sulfur containing DNRM:
This subclass is indented under subclass 71. Subject matter wherein the DNRM contains oxygen in either elemental or inorganic compound form.

83 Oxygen containing DNRM:
This subclass is indented under subclass 71. Subject matter wherein the DNRM contains oxygen in either elemental or inorganic compound form.

(1) Note. Included herein is the stated presence of air or the stated presence of oxygen in air.

84 Water:
This subclass is indented under subclass 83. Subject matter wherein oxygen is present as water in any of its physical forms.

85 Reacting an ethylenic monomer in the presence of a solid polymer:
This subclass is indented under subclass 84. Subject matter wherein an ethylenic monomer is reacted in the presence of a solid polymer and wherein water is present as a DNRM.

86 Treating a solid polymer:
This subclass is indented under subclass 84. Subject matter wherein a solid polymer is modified and wherein water is present as a DNRM.

87 Processes involving protein as reactant or as solid polymer; or compositions therefore:
This subclass is indented under subclass 1. Subject matter involving the preparation of a protein containing solid polymer; or the chemical modification of a solid polymer derived from a protein; or the modification of a solid polymer by reaction with a protein; or compositions therefore.

(1) Note. See Class 520 (a) the Glossary for a definition of the term “protein” and (b) Lines With Other Classes and Within This Class, section E for the type of polymer containing a protein that qualifies as a solid synthetic resin for the Class 520 Series.

(2) Note. This subclass provides for compositions for the processes provided for herein.

88 Processes involving carbohydrates as reactant or as solid polymer; or compositions therefore:
This subclass is indented under subclass 1. Subject matter involving the preparation of a carbohydrate containing solid polymer; or the chemical modification of a solid polymer derived from a carbohydrate; or the modification of a solid polymer by reaction with a carbohydrate; or composition therefore.

(1) Note. See Class 520 (a) the Glossary for a definition of the term “carbohydrate” and (b) Lines With Other Classes and Within This Class, section E for the type of polymer containing a carbohydrate that qualifies as a synthetic resin under the Class 520 Series.

(2) Note. This subclass provides for compositions for use in the processes provided for herein.

89 Preparing a polymer from carbohydrate and ethylenic reactant:
This subclass is indented under subclass 88. Subject matter involving solid polymer formation from a t least one ethylenic reactant and at least one carbohydrate reactant.

90 Processes involving a polyurethane having terminal ethylenic unsaturation as reactant or as solid polymer; or compositions therefore:
This subclass is indented under subclass 1. Subject matter involving treating a polyurethane having at least one terminal ethylenic group to form a solid polymer therefrom; or chemically modifying a solid polymer derived from a ployurethane reactant having at least one terminal ethylenic group; or chemically modifying a solid polymer by reaction with a polyurethane reactant containing at least one terminal ethylenic group; or compositions therefore.

(1) Note. Terminal ethylenic as used herein denotes a carbon atom bonded toan adjacent carbon through eithera double or triple bond and wherein at least one of the linked carbons is not bonded to another carbon atom either directly or indirectly through anoncarbon atom, with the provisothat indirect does not include the double or triple bond (e.g., C(1)-C(2)=C(3)-N-C(4) does not contain terminal unsaturation since carbon 2 is bonded directly to carbon 1 and since carbon 3 is indirectly bonded to carbon 4 through nitrogen.

(2) Note. HN-C=C-C_3 contains a terminally unsaturated group since carbon 1 is not bonded to any other carbon atom other than 2.

(3) Note. A polyurethane for purposes of this subclass requires a minimum of two urethane groups, i.e., HNO- but only one of the end units of the molecule need be terminally unsaturated.

(4) Note. This subclass provides for compositions for use in the processes provided for herein.

(5) Note. The unsaturated polyurethane can be a solid polymer devoid of ethylenic urethane groups which is modified to form unsaturated terminal groups and urethane linkages, and which is subsequently exposed to wave energy.

(6) Note. See Class 520, Glossary, for the definition of the term “ethylenically unsaturated”.

SEE OR SEARCH THIS CLASS, SUBCLASS:
113+, 134+, 150+, and 162+, for modifying a solid polymer derived from an unsaturated polyurethane reactant.

91 With a polysioxane reactant or polymer:
This subclass is indented under subclass 90. Subject matter wherein the unsaturated polyurethane is reacted with a Si-O-Si to form a solid polymer or in the presence of a solid polymer derived from a , and wherein C is the carbon of an organic radical.

92 With a reactant containing ethylenic unsaturation derived from poly 1,2-epoxide or polymer:
This subclass is indented under subclass 90. Subject matter wherein the unsaturated polyurethane is reacted to form a solid polymer with a material containing ethlenic unsaturation and which ethylenic material has been derived from a plural 1,2 expoxy containing material, or is reacted in the presence of a solid polymer containing ethylenic unsaturation and which ethylenic material has been derived from a plural 1,2 epoxy containing material.

93 With polycarboxylic acid or derivative and a polyol, a condensate or solid polymer thereof reactant:
This subclass is indented under subclass 90. Subject matter wherein the unsaturated polyurethane is reacted with a polycarboxylic acid or derivative and a polyol or a condensate thereof so as to form a solid polymer; or wherein the polyurethane is reacted in the pres-

ence of a solid polymer derived from a polycarboxylic acid or derivative and a polyol.

(1) Note. See Class 520, Glossary, for a definition of the term "carboxylic acid or derivative".

94 With aldehyde derivative reactant, condensate or solid polymer thereof:
This subclass is indented under subclass 90. Subject matter wherein the unsaturated polyurethane is reacted with an aldehyde derivative or condensate thereof to form a solid polymer therewith; or wherein a unsaturated polyurethane is reacted in the presence of a solid polymer derived from an aldehyde or aldehyde derivative.

(1) Note. See Class 520, Glossary, for a definition of the term "aldehyde" and "aldehyde derivative".

95 With solid polymer derived solely from ethylenic monomers:
This subclass is indented under subclass 90. Subject matter wherein the unsaturated polyurethane is reacted in the presence of a solid polymer derived from ethylenic monomers solely.

96 With ethylenic reactant:
This subclass is indented under subclass 90. Subject matter wherein the unsaturated urethane is reacted in the presence of an ethylenic reactant.

(1) Note. Included in this subclass are as reactants which may contain residual ethlenic unsaturation and were prepared from at least one nonethylenic reactant.

97 Polyurethane has an oxygen other than as part of a urethane or carboxylic acid ester group:
This subclass is indented under subclass 90. Subject matter wherein the unsaturated polyurethane contains at least one oxygen atom which is other than as an oxygen atom in a -NH-C(0)-0 or -C-C(0)-0- group.

98 Polyurethane has at least one nonterminal ethylenic group:
This subclass is indented under subclass 90. Subject matter wherein the unsaturated polyurethane contains at least one nonterminal ethylenic group.

SEE OR SEARCH THIS CLASS, SUBCLASS:
90, (1) and (2) Notes, for an explanation of the term "terminal".

99 Processes involving a polysiloxane having ethylenic unsaturation as reactant or as solid polymer; or compositions therefore:
This subclass is indented under subclass 1. Subject matter involving treating a group containing material having ethylenic unsaturation so as to form a solid polymer therefrom; or chemically modifying a solid polymer derived from a C C Si-O-S reactant containing ethylenic unsaturation; or chemically modifying a solid polymer with a C C Si-O-Si reactant containing ethylenic unsaturation; or composition therefore, and C is a carbon of an organic radical.

(1) Note. This subclass provides for compositions for use in processes provided for herein.

(2) Note. See Class 520, Glossary, for a definition of the term "ethylenically unsaturated".

SEE OR SEARCH THIS CLASS, SUBCLASS:
148, for a process of modifying a solid polymer derived from a silicon containing reactant.

100 Processes involving an ethylenically unsaturated material derived from poly 1,2-epoxide as reactant or a solid polymer; or compositions therefore:
This subclass is indented under subclass 1. Subject matter involving treating an ethylenically unsaturated material derived from a poly 1,2-epoxide so as to form a solid polymer therefrom; or chemically modifying a solid polymer derived from a reactant containing ethylenic unsaturation and derived from a 1,2-polyepoxide; or chemically modifying a solid

polymer with a reactant containing ethylenic unsaturation and derived from a 1,2-polyepoxide; or compositions therefor.

(1) Note. This subclass provides for compositions for use for processes provided for herein.

(2) Note. The ethylenically unsaturated reactant need not contain 1,2-epoxide groups if in fact it were derived from an epoxide material.

(3) Note. See Class 520, Glossary, for a definition of the term "ethylenically unsaturated".

SEE OR SEARCH THIS CLASS, SUBCLASS:

113+, 134+, 150+, and 162+, for a process of modifying a solid polymer derived from an unsaturated reactant derived from a 1,2-polyepoxide.

101 With polycarboxylic acid or derivative and a polyol, condensate or solid polymer thereof:

This subclass is indented under subclass 100. Subject matter involving the treatment of the unsaturated 1,2-polyepoxide with a polycarboxylic acid or derivative and a polyol or condensate thereof so as to form a solid polymer therewith; or wherein the unsaturated 1,2-polyepoxide derived material is reacted with s solid polymer derived from a polycarboxylic acid or derivative and a polyol.

(1) Note. See Class 520, Glossary, for a definition of the term "carboxylic acid or derivative".

102 With solid polymer derived solely from ethylenically unsaturated monomers:

This subclass is indented under subclass 100. Subject matter wherein the unsaturated material derived from the poly 1,2-epoxide is reacted with a solid polymer derived from ethylenically unsaturated reactants only.

103 With ethylenic reactant:

This subclass is indented under subclass 100. Subject matter wherein the unsaturated material derived from the poly 1,2-epoxide is reacted with an ethylenically unsaturated reactant.

104 Processes involving an ethylenically unsaturated polyester derived from a polycarboxylic acid or derivative and polyol, condensate or solid polymer thereof; or compositions therefore:

This subclass is indented under subclass 1. Subject matter involving forming an unsaturated solid polymer from at least one polycarboxylic acid or derivative and polyol or condensate thereof; or chemically modifying a solid polymer containing ethylenic unsaturation derived from at least one polycarboxylic acid or derivative and polyol or condensate thereof; or chemically modifying a solid polymer by treating with an unsaturated or saturated polycarboxylic acid or derivative and with a unsaturated or saturated polyol or codensate thereof with the proviso that at least the carboxylic acid or derivative, or polyol is unsaturated; or compositions therefore.

(1) Note. In the class definition, see section B in the General Summary of Subject Matter Within This Class for an explanation of the types of composition proper for this subclass.

(2) Note. The ethylenic unsaturation in the polymer need not be introduced by the polycarboxylic acid or derivative or polyol component, but can be in another reactant which is present during solid polymer formation.

(3) Note. The polycarboxylic acid or derivative and polyol need not be reacted with the solid polymer concurrently but may be added in a sequential manner.

(4) Note. See Class 520, Glossary, for a definition of the term "carboxylic acid or derivative".

(5) Note. A polyol contains two or more C-OH groups wherein the carbon atom bonded to the -OH moiety is not double bonded to a chalcogen atom.

105 With aldehyde or aldehyde derivative reactant or polymer thereof:

This subclass is indented under subclass 104. Subject matter wherein an aldehyde or aldehye derivative reactant is involved in the process.

(1) Note. See Class 520, Glossary, for a definition of the term “aldehyde” and “aldehyde derivative”.

(2) Note. The aldehyde or derivative reactant can be part of a solid polymer or can be a reactant with the polyol and polycarboxylic acid before solid polymer formation or subsequent to solid polymer formation.

106 With solid polymer derived from ethylenically unsaturated monomers only:
This subclass is indented under subclass 104. Subject matter wherein a solid polymer derived from ethylenically unsaturated reactant only is involved.

107 With ethylenic reactant:
This subclass is indented under subclass 104. Subject matter wherein an ethylenically unsaturated material is reacted with the condensate or solid polymer formed from the reactant of a polycarboxylic acid or derivative and a polyol.

(1) Note. Included in this subclass are solid polymers which contain residual unsaturation as reactants and which were prepared from a least one nonethylenic reactant.

108 Condensate or solid polymer contains oxygen other than as part of a carboxylic acid ester moiety:
This subclass is indented under subclass 104. Subject matter wherein the solid polymer or condensate of the reaction of a polyol and a polycarboxylic acid or derivative contains oxygen atoms which are not part of a carboxylic acid ester moiety.

109 Processes of chemically modifying a blend of two or more solid polymers in the presence of a chemical reactant; or compositions therefore:
This subclass is indented under subclass 1. Subject matter wherein at least two solid polymers are chemically modified in the presence of a material which reacts therewith; or compositions therefore.

(1) Note. See General Summary of Sunject Matter Within This Class in the class definition for the type of composition proper for this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
111, for a process of chemically modifying a mixture of solid polymers wherein the disclosure indicates that only one of the solids polymeres is chemically modified.

110 At least one solid polymer derived from ethylenic monomers only wherein at least one of the monomers has at least two ethylenic groups:
This subclass is indented under subclass 109. Subject matter wherein at least one of the solid polymers is derived from ethylenically unsaturated reactants only and at least one of the ethylenic reactants contains two or more ethylenically unsaturated groups.

(1) Note. See Class 520, Glossary, for a definition of the term “ethylenically unsaturated”.

111 Processes of treating a blend of two or more solid polymers or reacting one solid polymer; or reacting one solid polymer with another solid polymer; or compositions therefore:
This subclass is indented under subclass 1. Subject matter wherein at least two solid polymers are modified or are reacted with one another; or compositions thereof.

(1) Note. See the General Summary of Sunject Matter Within This Class in the class definition for the type of compositions proper for this subclass.

112 At least two solid polymers derived from ethylenic monomers only:
This subclass is indented under subclass 111. Subject matter wherein at least two solid polymers are derived from ethylenically unsaturated monomers only.

(1) Note. See Class 520, Glossary, for a definition of the term “ethylenically unsaturated”.

113 Processes of chemically modifying a solid polymer derived only from ethylenically

unsaturated monomers by treating polymer with a chemical reactant; or compositions therefore:
This subclass is indented under subclass 1. Subject matter wherein a solid polymer derived from ethylenic monomers only is chemically modified by treating said solid polymer with a material which reacts therewith; or compositions therefore.

(1) Note. See Class 520, Glossary, for a definition of the term "ethylenically unsaturated".

(2) Note. This subclass provides for compositionsfor use in processesprovidedfor herein.

114 Chemical reactant is ethylenically unsaturated:
This subclass is indented under subclass 113. Subject matter wherein the material which reacts with the solid polymer is ethylenically unsaturated.

115 Phosphorus:
This subclass is indented under subclass 114. Subject matter wherein the ethylenically unsaturated reactant contains at least one phosphorus atom.

116 Nitrogen:
This subclass is indented under subclass 114. Subject matter wherein the ethylenically unsaturated reactant contains at least one nitrogen atom.

117 Chemical reactant has two or more ethylenic groups:
Subject matter under subclasss 116 wherein the nitrogen reactants contains at least two ethylenic groups.

118 Sulfur:
This subclass is indented under subclass 114. Subject matter wherein the ethylenically unsaturated reactant contains at least one sulfur atom.

119 Chemical reactant has two or more ethylenic groups:
This subclass is indented under subclass 118. Subject matter wherein the sulfur reactant contains at least two ethylenic groups.

120 Oxygen:
This subclass is indented under subclass 114. Subject matter wherein the ethylenically unsaturated reactant contains at least one oxygen atom.

121 Chemical reactant has two or more ethylenic groups:
This subclass is indented under subclass 120. Subject matter wherein the oxygen reactant contains at least two ethylenic groups.

122 Hetero oxygen:
This subclass is indented under subclass 120. wherein the oxygen reactant contains at least one oxygen atom which is part of a heterocyclic group.

(1) Note. See Class 520, Glossary, for a definition of the term "heterocyclic".

123 Contains C-OH group other than as part of a COO-moiety:
This subclass is indented under subclass 120. Subject matter wherein the oxygen reactant contains an oxygen atom which is part of a C-OH group and wherein the carbon atom bonded to the -OH group is not double bonded to oxygen.

124 Carbon, hydrogen and halogen or carbon and halogen only:
This subclass is indented under subclass 114. Subject matter wherein the ethylenically unsaturated reactant is composed solely of carbon, hydrogen and halogen or solely of carbon and halogen.

(1) Note. Halogen is limited to fluorine, chlorine, iodine, bromine, or astatine.

125 Carbon and hydrogen only:
This subclass is indented under subclass 114. Subject matter wherein the ethylenically unsaturated reactant is composed solely of carbon and hydrogen.

126 Chemical reactant contains nitrogen:
This subclass is indented under subclass 113. Subject matter wherein the material which reacts with the solid polymer contains at least one nitrogen atom.

127 Chemical reactant contains sulfur:
This subclass is indented under subclass 113. Subject matter wherein the material which reacts with the solid polymer contains at least one sulfur atom.

128 Elemental sulfur:
This subclass is indented under subclass 127. Subject matter wherein elemental sulfur is a reactant.

129 Chemical reactant contains oxygen:
This subclass is indented under subclass 113. Subject matter wherein the material which reacts with the solid polymer contains at least one oxygen atom.

(1) Note. Included herein is the stated use of water in any of its physical forms, or the stated use of oxygen in air as a reactant.

130 Contains C=O moiety:
This subclass is indented under subclass 129. Subject matter wherein the oxygen reactant contains at least one carbon atom double bonded to oxygen, i.e.,

131 Chemical reactant is elemental halogen:
This subclass is indented under subclass 113. Subject matter wherein the material which reacts with the solid polymer is elemental halogen.

(1) Note. Compounds which liberate halogens are not proper for this subclass.

(2) Note. Halogen is limited to fluorine, chlorine, iodine, bromine and astatine.

132 Solid polymer treated contains halogen:
This subclass is indented under subclass 131. Subject matter wherein the solid polymer reacted with elemental halogen contains at least one halogen atom.

(1) Note. The solid polymer may have been derived from a halogen containing monomer or may have been treated with a halogen containing material so as to introduce halogen atoms therein prior to the reaction with elemental halogen.

133 Solid polymer derived from single monomer:
This subclass is indented under subclass 131. Subject matter wherein the solid polymer is derived from a single mononer.

134 Processes of chemically modifying a solid polymer or SICP derived from a least one saturated monomer by treating solid polymer or SICP with a chemical reactant; or compositions therefore:
This subclass is indented under subclass 1. Subject matter wherein a solid polymer derived from at least one nonethylenically unsaturated reactant or SICP is chemically modified by treating said solid polymer or SICP with a material which reacts therewith; or compositions therefore.

(1) Note. This subclass provides for compositions for use in processes provided for herein.

(2) Note. See Class 520,Glossary, for a definition of the term “specified intermediate condensation product (SICP)”.

135 Chemical reactant is ethylenically unsaturated:
This subclass is indented under subclass 134. Subject matter wherein the material which reacts with the solid polymer is ethylenically unsaturated.

136 Nitrogen:
This subclass is indented under subclass 135. Subject matter wherein the ethylenically unsaturated reactant contains at least one nitrogen atom.

137 Chemical reactant has two or more ethylenic groups:
This subclass is indented under subclass 136. Subject matter wherein the nitrogen reactant contains at least two ethylenic groups.

138 Hetero nitrogen:
This subclass is indented under subclass 136. Subject matter wherein the nitrogen reactant contains at least one nitrogen atom which is part of a heterocyclic ring.

(1) Note. See Class 520, Glossary, for a definition of the term "heterocyclic ring".

139 N-C=O containing:
This subclass is indented under subclass 136. Subject matter wherein the nitrogen reactant contains a nitrogen atom as part of a N-C=O group.

140 Two or more N-C=O Groups:
This subclass is indented under subclass 139. Subject matter wherein the nitrogen reactant contains two or more N-C=O groups.

141 Chalcogen:
This subclass is indented under subclass 135. Subject matter wherein the ethylenically unsaturated reactant contains at least one chalcogen atom.

(1) Note. Chalcogen is limited to oxygen, sulfur, selenium or tellurium.

142 Chemical reactant has two or more ethylenic groups:
This subclass is indented under subclass 141. Subject matter wherein the chalcogen reactant contains at least two ethylenic groups.

143 Hetero oxygen:
This subclass is indented under subclass 141. Subject matter wherein the chalcogen reactant contains an oxygen atom which is part of a heterocyclic ring.

(1) Note. See Class 520, Glossary, for a definition of the term "heterocyclic ring".

144 Carboxylic acid or derivative:
This subclass is indented under subclass 141. Subject matter wherein the chalcogen reactant contains an oxygen atom as part of a carboxylic acid or derivative and moiety.

(1) Note. See Class 520, Glossary, for a definition of the term "carboxylic acid or derivative".

145 Chemical reactant has two or more ethylenic groups and contains only carbon and hydrogen:
This subclass is indented under subclass 135. Subject matter wherein the ethylenic unsaturated reactant contains only carbon and hydrogen atoms and at least two ethylenic groups.

146 Chemical reactant contains chalcogen:
This subclass is indented under subclass 134. Subject matter wherein the material that reacts with the solid polymer contains at least one chalcogen atom.

(1) Note. Chalcogen is limited to oxygen, sulfur, selenium and tellurium.

(2) Note. In the absence of information to the contrary oxygen in air is not considered to be a reactant.

147 Chemical reactant contains halogen:
This subclass is indented under subclass 134. Subject matter wherein the material that reacts with the solid polymer contains at least one halogen atom.

(1) Note. Halogen is limited to flourine, chlorine, iodine, bromine or astatine.

148 Processes of treating a solid polymer or SICP derived from silicon containing reactant; or compositions therefore:
This subclass is indented under subclass 1. Subject matter wherein a solid polymer or SICP derived from at least one silicon reactant is treated; or compositions therefor.

(1) Note. See the General Summary of Subject Matter Within This Class in the class definition for the type of composition proper for this subclass.

(2) Note. See Class 520, Glossary, for the definition of the term "specified intermediate condensation product (SICP)".

149 Processes of treating a reaction product of a solid polymer and ethylenic reactant; or

compositions therefore, e.g., graft-or graft-type polymer, etc.:
This subclass is indented under subclass 1. Subject matter wherein a solid polymer which is the product of at least one solid polymer and an ethylenically unsaturated reactant is treated; or compositions therefore, e.g., graft copolymer, etc.

(1) Note. See the General Summary of Subject Matter Within This Class in the class definition for the type of composition proper for this subclass.

(2) Note. See Class 520, Glossary, for a definition of the term "ethylenically unsaturated".

150 Processes of treating a solid polymer derived from ethylenic monomers only; or compositions therefore:
This subclass is indented under subclass 1. Subject matter wherein a solid polymer derived from ethylenically unsaturated monomers only is chemically modified in the absence of a material which reacts therewith; or compositions therefore.

(1) Note. See the General Summary of Subject Matter Within This Class in the class definition for the type of composition proper for this subclass.

(2) Note. See Class 520, Glossary, for a definition of the term "ethylenically unsaturated".

SEE OR SEARCH THIS CLASS, SUBCLASS:

161, for solid polymers which are chemically modified (nonwave energy step) and which are treated with wave energy subsequent to the chemical treatment are classified on the basis of the first solid polymer. An example of this would be hallucinating polyethylene with wave energy.

151 Solid polymer derived from nitrogen containing monomer:
This subclass is indented under subclass 150. Subject matter wherein the solid polymer is derived from at least one nitrogen containing ethylenic monomer.

152 Nitrogen containing monomer contains oxygen:
This subclass is indented under subclass 151. Subject matter wherein the nitrogen containing ethylenic monomer also contains at least one atom of oxygen.

153 Solid polymer derived from carboxylic acid or derivative monomer:
This subclass is indented under subclass 150. Subject matter wherein the solid polymer is derived from at least one ethylenically unsaturated carboxylic acid derivative.

(1) Note. See Class 520, Glossary, for a definition of the term "carboxylic acid or derivative".

154 Oxygen other than as part of carboxylic acid or derivative moiety:
This subclass is indented under subclass 153. Subject matter wherein addition to the carboxylic acid or carboxylic acid derivative moiety there is additionally present in the same molecule an oxygen atom which is not part of a carboxylic acid or carboxylic acid derivative moiety.

155 Solid polymer derived from halogen containing monomer:
This subclass is indented under subclass 150. Subject matter wherein the solid polymer is derived from at least one ethylenically unsaturated monomer containing at least one halogen atom.

(1) Note. Halogen is limited to fluorine, chlorine, iodine, bromine or astatine.

156 Halogen is fluorine:
This subclass is indented under subclass 155. Subject matter wherein at least one of the halogen atoms is fluorine.

157 Solid polymer derived from monomer containing only carbon and hydrogen:
This subclass is indented under subclass 150. Subject matter wherein the solid polymer is derived from at least one ethylenically unsaturated monomer which contains only carbon and hydrogen atoms.

158 At least one reactant contains two or more ethylenic groups:
This subclass is indented under subclass 157. Subject matter wherein the unsaturated monomer containing at least two ethylenic groups.

159 Polyisoprene or natural rubber:
This subclass is indented under subclass 158. Subject matter wherein the solid polymer is derived solely from isoprene or the product to be treated is natural rubber or a modified form thereof, e.g., rubber hydrochloride, etc.

160 Carbocyclic ring containing, e.g., styrene, etc.:
This subclass is indented under subclass 157. Subject matter wherein the unsaturated monomer containing only carbon and hydrogen atoms contains at least one carbocyclic ring, e.g., styrene, etc.

161 Derived from ethylene:
This subclass is indented under subclass 157. Subject matter wherein the solid polymer derived from ethylene.

162 Processes of treating a solid polymer or SICP derived from at least one nonethylenic reactant or compositions therefore:
This subclass is indented under subclass 1. Subject matter wherein a solid polymer or SICP derived from at least one nonethylenic reactant is chemically modified in the absence of a material which reacts therewith, or compositions therefore.

(1) Note. See General Summary of Subject Matter Within Thsi Class in the class definition for the type of composition proper for this subclass.

(2) Note. See Class 520, Glossary, for the definition of the term “specified intermediate condensation product (SICP)”.

163 Solid polymer or SICP derived from reactant having halo-C(=O)-halo, halo-C(=O)-O, or -O-C(=O)-O-group:
This subclass is indented under subclass 162. Subject matter wherein the solid polymer or SICP modified is formed from at least one reactant containing a halo hal, haloO or -OO-group.

164 Solid polymer or SICP derived from polycarboxylic acid or derivative and organic amine or from organic amine salt of a polycarboxylic acid:
This subclass is indented under subclass 162. Subject matter wherein the solid polymer or SICP modified is formed from at least two reactants, at least one of which is a polycarboxylic acid or derivative and at least one of which is an organic amine, or from at least one reactant which is an amine salt or a polycarboxylic acid.

(1) Note. See Class 520, Glossary, for definition of the term “carboxylic acid or derivative”. The term “polycarboxylic” can also be found under the above heading.

(2) Note. See Class 520, Glossary, for as definition of the term “amine”.

165 Solid polymer or SICP derived from polycarboxylic acid or derivative and polyol:
This subclass is indented under subclass 162. Subject matter wherein the solid polymer or SICP modified is formed from at least two reactants, at least one of which is a polycarboxylic acid or derivative and at least one of which is a polyol.

(1) Note. See Class 520, Glossary, for a definition of the term “carboxylic acid or derivative”. The term “polycarboxylic” can also be found under the heading.

(2) Note. A polyo contains two or more C-OH groups wherein the carbon atom bonded to the oxygen of the -OH moiety is not double bonded to a chalcogen atom.

166 Solid polymer or SICP derived from at least one heterocyclic monomer or aldehyde derivative:
This subclass is indented under subclass 162. Subject matter wherein the solid polymer or SICP modified is formed from at least one reactant containing a heterocyclic ring or is formed from an aldehyde or aldehyde derivative.

(1) Note. See Class 520, Glossary, for definitions of the terms “heterocyclic “aldehyde” and “aldehyde derivative”.

167 Processes of preparing a solid polymer from heterocyclic nitrogen monomer; or compositions therefore, e.g., carbazole, etc.:
This subclass is indented under subclass 1. Subject matter wherein a monomer containing a nitrogen atom as part of a heterocyclic ring is polymerized so as to form a solid polymer; or compositions therefore.

(1) Note. See Class 520, Glossary, for a definition of the term “heterocyclic”.

(2) Note. See General Summary of Subject Matter Within This Class in the class definition for the type of composition proper for this subclass.

168 Processes of preparing a solid polymer from a heterocyclic chalcogen monomer; or compositions therefore:
This subclass is indented under subclass 1. Subject matter wherein a monomer containing a chalcogen atom as part of a heterocyclic ring is polymerized so as to form a solid polymer; or compositions therefore.

(1) Note. Chalcogen is limited to oxygen, sulfur, selenium or tellurim.

(2) Note. See Class 520, Glossary, for a definition of the term “heterocyclic”.

(3) Note. See General Summary of Subject Matter Within This Class in the class definition for the type of composition proper for this subclass.

169 Two or more hetero atoms in hetero ring at least one of which is oxygen:
This subclass is indented under subclass 168. Subject matter wherein the heterocyclic reactant contains at least two hetero atoms in the same hetero ring and wherein at least one of said hetero atoms is oxygen.

170 1,2-Epoxy:
This subclass is indented under subclass 168. Subject matter wherein the heterocyclic reactant contains a 3-membered hetero ring composed of one oxygen and two carbon atoms.

171 Processes of preparing a solid polymer from at least one phosphorus containing monomer; or compositions therefore:
This subclass is indented under subclass 1. Subject matter wherein a monomer containing at least at least one phosphorus atom polymerized so as to as to form a solid polymer; or compositions therefore.

(1) Note. See General Summary of Subject Matter Within This Class in the class definition for the type of composition proper for this subclass.

172 Processes of processes of preparing a solid polymer from at least one silicon containing monomer; or compositions therefore:
This subclass is indented under subclass 1. Subject matter wherein a monomer containing at least one silicon atom is polymerized so as to form a solid polymer; or compositioins therefore.

(1) Note. See General Summary of Subject Matter Within This Class in the class definition for the type of composition proper for this subclass.

173 Processes of preparing a solid polymer from at least one nitrogen containing monomer; or compositions therefore:
This subclass is indented under subclass 1. Subject matter wherein a monomer containing at least one atom of nitrogen is polymerized so as to form a solid polymer; or compositions therefore.

(1) Note. See General Summary of Subject Matter Within This Class in the class definition for the type of composition proper for this subclass.

174 Nitrogen containing reactant contains a N-C=O or N=C=O moiety:
This subclass is indented under subclass 173. Subject matter wherein the nitrogen monomer polymerized contains a N-C=O or N=C=O moiety.

175 Acrylamide or methacrylamide:
This subclass is indented under subclass 174. Subject matter wherein the N-C=O reactant is acrylamide or methacrylamide.

176 Organic polyamine and polycarboxylic acid or derivative or from an organic amine salt of a polycarboxylic acid:
This subclass is indented under subclass 173. Subject matter wherein an organic polyamine and a polycarboxylic acid or derivative are reacted so to form a solid polymer; or from at least one reactant which is an organic amine salt of a polycarboxylic acid.

(1) Note. See Class 520, Glossary, for a definition of the term "carboxylic acid or derivative". The definition of the term "polycarboxylic" also can be found under above heading.

(2) Note. See Class 520, Glossary, for a definition of the term "amine".

177 Acrylonitrile or methacrylonitrile:
This subclass is indented under subclass 173. Subject matter wherein the nitrogen reactant is acrylonitrile or methacrylonitrile.

178 Process of preparing a solid polymer from at least one oxygen containing monomer; or compositions therefore:
This subclass is indented under subclass 1. Subject matter wherein a monomer containing at least one atom of oxygen is polymerized so as to form a solid polymer; or compositions therefore.

(1) Note. See General Summary of Subject Matter Within This Class in the class definition for the type of composition proper for this subclass.

179 Polycarboxylic acid or derivative and polyol, or condensate thereof, e.g., dimethyl-terephthalate, etc.:
This subclass is indented under subclass 178. Subject matter wherein a polycarboxylic acid or a derivative thereof and a polyol, or a condensate thereof, are reacted so as to form a solid polymer.

(1) Note. See Class 520, Glossary, for a definition of the term "carboxylic acid or derivative". The definition of the term "polycarboxylic" also can be found under the above heading.

(2) Note. A polyol contains two or more C-OH groups wherein the carbon atom bonded to the -OH moiety is not double bonded to a chalcogen atom.

180 Sulfur containing:
This subclass is indented under subclass 178. Subject matter wherein the oxygen reactant also contains a sulfur atom.

181 Ether group:
This subclass is indented under subclass 178. Subject matter wherein the oxygen atom is part of a C-O-C group and wherein the carbon atoms bonded to the oxygen atom are not bonded to oxygen, selenium, or tellurium.

182 Carboxylic acid or derivative:
This subclass is indented under subclass 178. Subject matter wherein the oxygen atom is part of a carboxylic acid or derivative group.

(1) Note. See Class 520, Glossary, for a definition of the term "carboxylic acid or derivative".

183 Oxygen other than as part of a COO-group:
This subclass is indented under subclass 182. Subject matter wherein the carboxylic acid or derivative contains an oxygen atom which is not part of a carboxylic acid or derivative group.

184 Processes of preparing a solid polymer from ethylenic reactants only; or compositions therefore:
This subclass is indented under subclass 1. Subject matter wherein a solid polymer is derived by polymerizing reactants all of which are ethylenically unsaturated.

(1) Note. See General Summary of Subject Matter Within This Class in the class definition for the type of composition proper for this subclass.

(2) Note. See Class 520, Glossary, for a definition of the term "ethylenically unsaturated".

185 Carbon, hydrogen and halogen only reactant contains at leasst three carbon atoms:
This subclass is indented under subclass 184. Subject matter wherein at least one reactant containing at least three carbon atoms composed solely of carbon, hydrogen and halogen is polymerized.

(1) Note. Halogen is limited to fluorine, chlorine, iodine, bromine and astatine.

186 At least one reactant contains two or more ethylenic groups:
This subclass is indented under subclass 184. Subject matter wherein an ethylenic reactant containing two or more ethylenic groups is polymerized.

187 At least one reactant contains halogen:
This subclass is indented under subclass 184. Subject matter wherein an ethylenic reactant which contains at least one halogen atom is polymerized.

(1) Note. Halogen is limited to fluorine, chlorine, iodine, bromine and astatine.

188 Derived from aromatic hydrocarbon:
This subclass is indented under subclass 184. Subject matter wherein an ethylenic reactant composed only of carbon and hydrogen atoms and which contains an aryl ring is polymerized.

(1) Note. See Class 520, Glossary, for a definition of the term "aryl".

189 Derived from ethylene only:
This subclass is indented under subclass 184. Subject matter wherein the sole reactant polymerized is ethylene.

CROSS-REFERENCE ART COLLECTIONS

The following subclasses are collections of published disclosures pertaining to various aspects of art relating to wave energy, and which aspects do not form an appropriate base for subclass classification in the classification schedule.

(1) Note. Disclosures are placed for value as a search aid and in no instance do they represent the entire extent of the prior art.

901 DARK STORAGE STABILIZER:
Subject matter involving the use of a material that protects in the dark a photoreactable composition from chemical change.

902 AIR INHIBITION:
Subject matter involving reaction problems due to the presence of air during a wave energy step.

SEE OR SEARCH THIS CLASS, SUBCLASS:
915, for the use of an inert gas, steam, nitrogen gas, or carbon dioxide as replacement atmospheres for air.

903 REMOVAL OF RESIDUAL MONOMER:
Subject matter wherein polymers contaminated with monomer are treated by a wave energy step so as to remove any residual monomer.

904 MONOMER OR POLYMER CONTAINS INITIATING GROUP:
Subject matter wherein the monomer selected to be reacted or a polymer to be treated contains functional groups which are sensitive to wave energy and thereby assist the chemical reaction upon exposure to wave energy to proceed.

905 BENZOPHENONE GROUP:
This subclass is indented under subclass 904. Subject matter wherein the monomer or polymer contains the RR groups wherein R is an aryl group.

906 PREPARING SHRINKABLE MATERIAL:
Subject matter involving treating material with wave energy so as to impart shrinkable propeerties thereto.

907 INVOLVING PRECURSOR OF AN ULTRAVIOLET ABSORBER E.G., RESORCINOL MONOBENZOATE, ETC.:
Subject matter wherein a material which is present during a wave energy step is converted to an ultraviolet absorber, e.g., resorcinol monobenzoate rearranges to a phenone so as to become an ultraviolet stabilizer, etc.

908 DENTAL UTILITY:
Subject matter involving treating material for use in dentistry (e.g., plate or bridge manufacture, tooth filling, etc.).

909 SOLVENTLESS INK:
Subject matter involving an ink in which all liquid components are reactable to wave energy.

910 TREATMENT THROUGH AN EXTERNAL FILTER OR MASK (NONPHOTOGRAPHIC PROCESS):
Subject matter relating to passing wave energy through a nonimaging mask or filter.

911 SPECIFIED TREATMENT INVOLVING ONE MEGARAD OR LESS:
Subject matter relating to specific processes of treating materials so as to cause a chemical reaction involving wave energy of one megarad (1 MRAD) or less.

(1) Note. Specific for purposes of this subclass is limited to examples involving 1 MRAD or less and not to generic disclosures wherein a range is recited and one of the range can include the subject matter of this subclass.

912 POLYMER DERIVED FROM ETHYLENIC MONOMERS ONLY:
This subclass is indented under subclass 911. Subject matter wherein the exemplified treatment involving one megarad or less is applied to ethylenic monomers only or to a polymer derived from ethylenic monomers only.

913 NUMERICALLY SPECIFIED DISTINCT WAVELENGTH:
Subject matter relating to reactions involving wave energy whose wave length is specifically recited or wherein a very narrow waveband is recited.

(1) Note. Specific for purposes of this subclass is limited to examples involving a single wavelength and does not include wave energy that is narrowly defined by a specific band of wavelength (e.g., visible light, microwave, near or for u.v., etc.).

914 WAVELENGTH OF 200 NANOMETERS OR LESS:
This subclass is indented under subclass 913. Subject matter wherein the exemplified treatment involves wave energy having a wavelength of 200 nanometers or less.

915 INVOLVING INERT GAS, STEAM, NITROGEN GAS, OR CARBON DIOXIDE:
Subject matter wherein wave energy is transmitted through a medium of an inert gas, steam, nitrogen gas, or carbon dioxide and which medium is in direct contact with the material treated by the wave energy.

(1) Note. Nitrogen gas or carbon dioxide in air is not considered as being nitrogen gas or carbon dioxide for this subclass.

END